

SPANISH FISHERIES IN ICES AREA VIII, 1950-1999

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ABSTRACT

The following report discusses the main data discrepancies between the catch datasets from ICES and Spanish national statistics, and explores the reasons behind these differences. Furthermore, a summary of major fisheries off the north coast of Spain (ICES area VIII) is provided, together with catch summaries.

DISCREPANCIES BETWEEN ICES AND SPANISH NATIONAL STATISTICS

A major obstacle in analyzing the Spanish fisheries in ICES area VIII is the availability and accuracy of statistical information. Both ICES and Spanish Fisheries Yearbooks (SFY) offer data for 1950-1999, with ICES data being provided by Spain through official statistics. Examining the landings data from each source reveals that both sources have biases in their reported statistics and differed from each other (Figure 1). The Spanish landings reported by the SFY were, on average, 3.8 times higher than those reported by ICES before 1978, with the greatest differences occurring in the late 1960s. Two problems make it difficult to determine exactly what the data from each source portray.

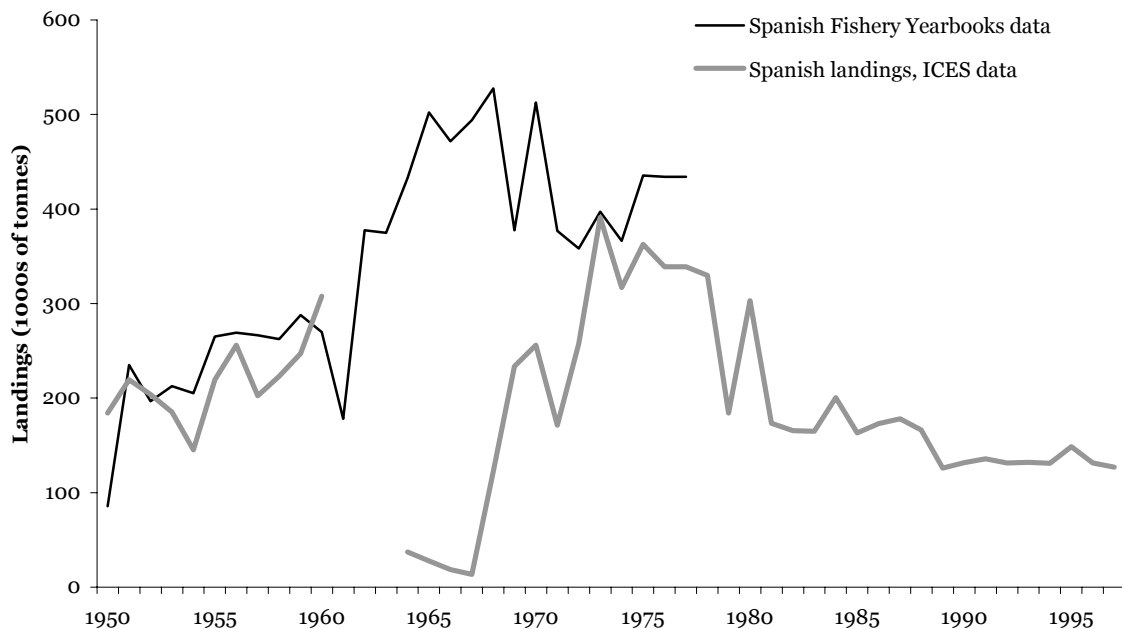


Figure 1. Comparison between Spanish Fisheries Yearbook data and ICES data for Spanish landings in ICES area VIII during the period 1950 to 1997.

The first problem is that the catching zones reported by the two sources are geographically different (Figure 2). The SFY structured the study area in two different areas: Cantabrian and Northwest areas, which are not congruent with the ICES divisions. Further, ICES divided its Northwestern region into two parts: North of 42° N belonged to area VIIIc, and south of this latitude belonged to area IXa. The practical consequences of this discrepancy were evident: when Spain sent catch data from area VIII, Spanish bodies summed the data of these areas without taking into account that nearly half of the Northwestern region did not belong to area

VIII. This may have heavily affected the validity of the ICES data for Spain until 1989.

The second problem is as important as the previous one: even more often than ICES, the SFY only referred to where catches were landed, making it almost impossible to determine where they were fished. For example, there was an obvious difference between sources in recorded landings of Atlantic cod (*Gadus morhua*), as well as other commercial species such as hake (*Meluccius merluccius*) and blue whiting

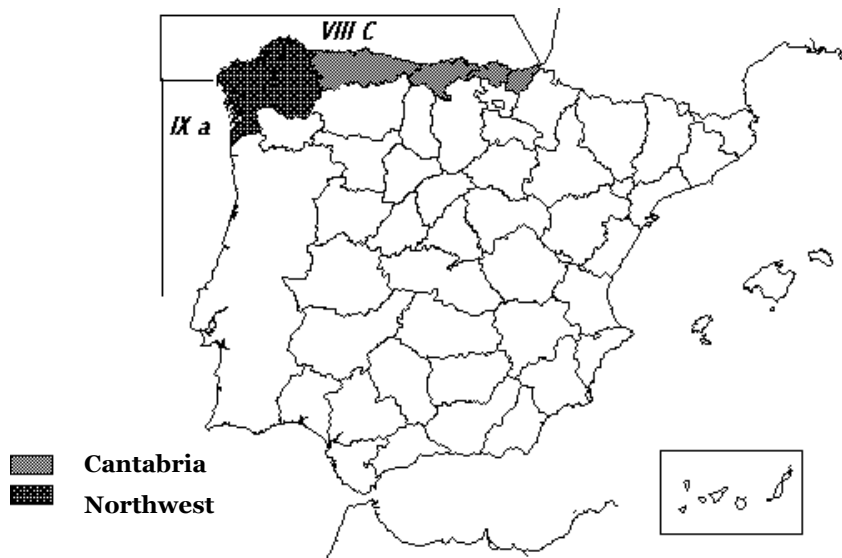


Figure 2. Comparison of the ICES divisions (areas VIIIc, IXa) with the Spanish statistical regions (Cantabrian and Northwest).

(*Micromesistius poutassou*) (Figure 3). In each of these cases, especially for Atlantic cod, the SFY landings statistics were much higher than ICES statistics. This was probably because part or all of the SFY landings in area VIII were caught elsewhere, whereas ICES made some attempt to record where the fish were caught and not just where they were landed. Hake caught by trawlers in ICES areas VII and VI are landed and registered in area VIII (Figure 3). Catches from other fisheries, after filtering or estimating those from area IXa, were likely from area VIII. The fish obviously caught in other areas have been removed from the SFY data set.

In 1960, the ICES landings in area VIII of most species were equal to the sum of the SFY landings in the Cantabrian Sea and Northwestern ports, except for common sole (*Solea solea*), northern bluefin tuna (*Thunnus thynnus*), albacore tuna (*Thunnus alalunga*), and Atlantic horse mackerel (*Trachurus trachurus*) (Table 1). In the case of albacore and northern bluefin tuna, most of the catches were from area VIII (although not just VIIIc). Since the 1960s, however, these species were increasingly fished in waters of the Azores Archipelago (see Morato *et al.*, this volume). In 1973, there were greater differences between the ICES area VIII and SFY reported landings (Table 2). The differences in the tuna data (Tables 1 and 2) most likely relates to the way in which ICES accounts for landings of all tunas in the north of Spain. Whereas albacore had the highest landings in area VIII among different tunas, they were likely recorded as northern bluefin tuna by ICES in 1960.

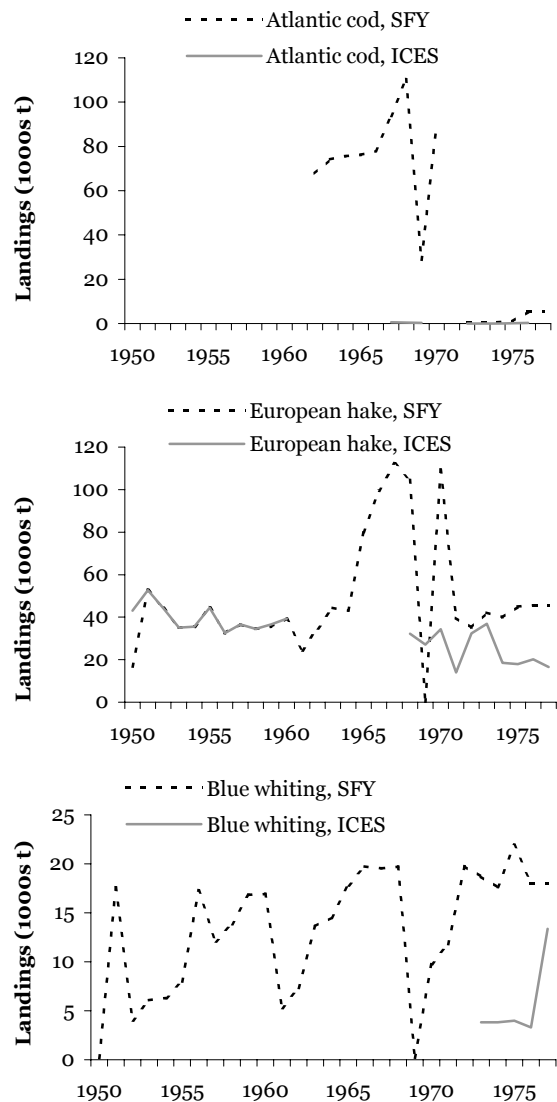


Figure 3. Comparison between Spanish Fisheries Yearbook data and ICES data for Spanish landings of Atlantic cod, hake, and blue whiting, in ICES area VIII during 1950 to 1977.

Table 1. ICES data of Spanish landings in ICES area VIII and Spanish data of landings in Cantabrian (C) and Northwest (N) Zones. Statistics for the year 1960, in tonnes. The species for which the catch in both sources do not match are in bold.

Species name	Common name	ICES	Spanish statistics		
		Zone VIII	C+N	C	N
<i>Anguilla anguilla</i>	European eel	33	32.9	18.8	14.1
<i>Belone belone belone</i>	Garpike	804	804.4	9.3	795.1
<i>Conger conger</i>	European conger	3,231	3,231.1	511.9	2,719.2
<i>Lepidorhombus whiffiagonis</i>	Megrim	6,839	6,838.9	1,337.4	5,501.5
<i>Lophius piscatorius</i>	Anglerfish	4,440	4,439.8	1,155.4	3,284.4
<i>Merluccius merluccius</i>	European hake	39,357	39,356.6	19,723.6	19,633.0
<i>Pollachius pollachius</i> ^{a)}	Pollack	558	557.8	36.3	521.5
<i>Psetta maxima</i>	Turbot	87	88.6	2.3	86.3
<i>Sardina pilchardus</i>	European pilchard	38,244	38,243.9	1,797.0	36,446.9
<i>Scomber scombrus</i>	Atlantic mackerel	5,270	5,270.4	4,339.1	931.3
<i>Solea solea</i>	Common sole	408	84.2	42.1	42.1
<i>Spondyliosoma cantharus</i>	Black seabream	4,171	4,171.6	96.7	4,074.9
<i>Sprattus sprattus</i>	European sprat	20	20.1	0.1	20.0
<i>Thunnus thynnus thynnus</i>	Northern bluefin tuna	31,204	298.0	292.8	5.2
<i>Thunnus alalunga</i>	Albacore	0	5,412.1	-	-
<i>Trachurus trachurus</i>	Atlantic horse mackerel	30,047	8,304.5	5,888.7	2,415.8

^{a)} In Spanish Statistics, this fish appears as '*Gadus pollachius*'.

The discrepancies between the two sources of statistics are even more evident when we look closer at hake catches in European waters in 1973 (Table 2) and 1976 (Table 3), which were greater in the ICES than in the SFY data set. The two estimates were closer from 1977 onwards (Table 3). We are not certain of where the fish were caught due to lack of information from SFY. However, most of the Spanish trawlers or longliners working in areas VI and VII came from the Northwest zone, while most of the Cantabrian trawlers worked on the French continental shelf. These trawlers were targeting hake and associated species (blue whiting, anglerfish [*Lophius piscatorius*], megrim [*Lebidorhombus whiffiagonis*]), which are almost exclusively deep sea species. Some problems of species identification would have arisen in, for example, different species of tuna and sea bream. However, this by itself would not explain the large differences between sources, especially when we look at the total catch instead of at individual species that may have been misidentified.

ICES data were missing in the 1960s for several important commercial species such as Atlantic horse mackerel, Atlantic mackerel (*Scomber scombrus*), hake and European pilchard (*Sardina pilchardus*). For other important species such as albacore, blue whiting, and European anchovy (*Engraulis encrasicolus*), records only began in the late 1960s or 1970s. The missing ICES data for these important species could explain why the ICES total landings are considerably lower in the 1960s than SFY data (Figure 1). A major part of this discrepancy between data sources in the early 1960s appears to be for pelagic fish (Figure 4a), as well as for the species in Figure 3. Very little of this discrepancy, if any, can be accounted for by categorizing fish as 'unidentified', 'various', or 'unsorted' instead of as their proper species label (Figure 4b). The 'unidentified' category of the SFY data was even larger than the ICES one, accounting for 10% of the total landings between 1950-1977.

Table 2. ICES data of Spanish landings in ICES area VIII and Spanish data of landings in Cantabrian (C) and Northwest (N) Zones. Statistics for the year 1973, in tonnes. The species for which the catch in both sources do not match are in bold.

Common name	Spanish statistics			ICES					Total ICES
	C+N	C	N	VIII	IX	VII	VI	VIII+IX	
European conger	2,595.5	632.3	1,963.2	943	461	921	686	1,404	3,049
European anchovy	23,195.9	23,189.1	6.8	23,196	2,332	-	-	25,528	25,528
Dusky grouper	199.6	72.9	126.7	199	169	-	-	368	368
Atlantic cod	419.8	214.2	205.6	30	-	301	208	30	4,125
Megrim	10,296.9	1,847.6	8,449.3	876	-	8,747	727	876	11,949
Angler	12,501.3	3,036.1	9,465.2	775	503	11,202	428	1,278	12,995
Haddock	1,666.6	-	1,666.6	42	-	890	497	42	4,041
Whiting	-	-	-	65	-	1,121	1,540	65	3,011
European hake	42,191.9	19,384.1	22,807.8	15,597	20,812	19,838	6,455	36,409	62,926
Blue whiting	18,738.3	6,087.2	1,2651.1	3,816	99	8,821	5,751	3,915	18,837
Striped red mullet	247.4	227.4	20.0	-	-	-	-	0	489
Saithe	-	-	-	220	-	444	1,980	220	5,064
European pilchard	44,768.0	8,569.9	36,198.1	44,768	18,523	-	-	63,291	63,291
Atlantic mackerel	25,676.2	11,780.0	13,896.2	25,677	2,334	-	-	28,011	28,011
Common sole	376.6	45.1	331.5	116	1,535	209	-	1,651	1,891
Black seabream	7,404.3	1,056.1	6,348.2	-	-	-	-	-	-
Albacore	15,001.5	10,500.2	4,501.3	19,322	1	-	-	19,323	19,323
Northern bluefin tuna	2,192.2	1,935.9	256.3	3,395	651	-	-	4,046	4,046
Atlantic horse mackerel	111,843.2	44,674.0	67,169.2	90,368	1,518	15,624	5,851	91,886	113,361
Pouting	7,732.9	3,554.7	4,178.2	3,865	160	3,187	680	4,025	7,892
Swordfish	5,245.4	0	5,245.4	5,245	1,020	-	-	6,265	6,265

Table 3. Comparison of Spanish hake (*Merluccius merluccius*) landings (tonnes) in European waters in 1976 and 1977 from ICES and Spanish sources.

ICES area	ICES stats		Spanish statistical region	Spanish sources		
	1976	1977		1976	1977	
VI	4,120	1,579	-			
VII	20,820	5,299	-			
VIII	20,202	16,630	Cantabria	Hake	5,472	3,734
				Small hake	18,139	14,950
				total	23,611	18,684
IX	13,710	17,501	Northwest	Hake	4,884	4,259
				Small hake	17,119	18,066
				total	22,003	22,325
Total	58,852	41,009		45,614	41,009	

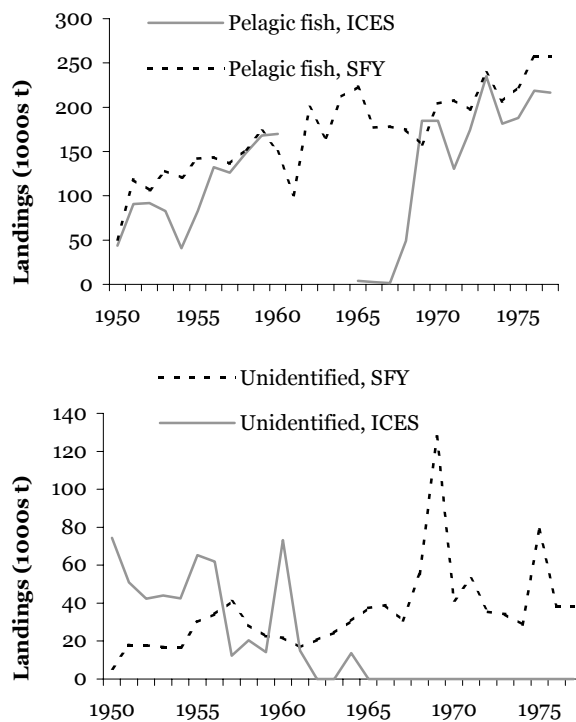


Figure 4. Comparison between Spanish Fisheries Yearbook data and ICES data for Spanish landings of pelagic fish (upper panel), including commercially important species such as Atlantic horse mackerel, Atlantic mackerel, European pilchard, Albacore, bluefin tuna, and European anchovy; and unidentified catch (lower panel), in ICES area VIII during 1950 to 1977.

A SHORT DESCRIPTION OF THE SPANISH FLEETS IN ICES AREA VIII

The number of boats employed in the trawling, purse seine, and surface Spanish fleets remained fairly constant from 1978 to 1986 (Figure 5). The total landings reported by ICES fluctuated, decreasing in the first few years of that period before they stabilized and remained fairly constant after 1981.

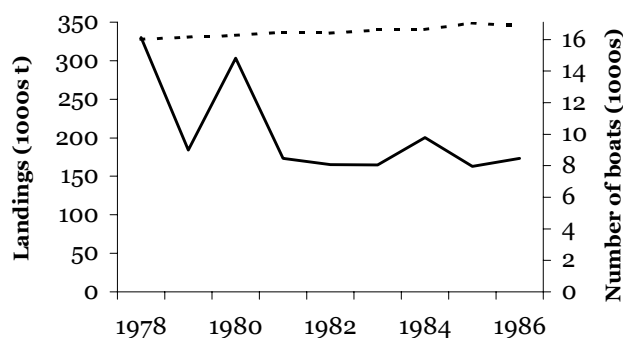


Figure 5. Landings (ICES data, solid line) and number of boats in the Spanish fishery from 1978-1986 (trawlers, purse seines and surface fisheries, dotted line).

The Spanish fisheries in area VIII are characterized by the diversity and the heterogeneity of processes, techniques, objectives, and organizational structures. However, the fisheries can be divided into three broad types:

Coastal fleet

In the Basque Country, as in the rest of area VIII, the coastal fleet typically employs small motor vessels of up to 30 GRT, even though it is possible to find vessels of higher tonnage (Table 4). Other characteristics of the fishing methods utilized are also presented in Table 4; note however, that vessels may switch gears very rapidly. The range of fishing methods is wide because depending on the season, and also the market, fishers can employ longlines, pole and lines, hand lines, bottom nets and traps interchangeably.

As mentioned, the thoroughness of landings recorded for a given species may vary depending on the port and its traditions, as well as on the area within the Cantabrian Sea. The fishing grounds of the Basque coast, Cantabria, and Asturias are shown in Figures 6, 7, and 8, respectively. These three regions plus the coast of the province of Lugo compose the Cantabrian coast, or the Spanish coastline of ICES area VIIIc. Obtaining information for all the ports and fishing districts of area VIII is difficult, as official statistics ceased in 1986 and the literature published by local bodies is very scarce. Nevertheless, data for the Basque coast is complete enough to give a clear picture of the different fisheries carried out in the grounds close to shore. Table 5 shows the different species caught by the Basque coastal fleet, listed by fishing methods, between July 1991 and June 1992.

Although the Atlantic mackerel fishery, using primarily hand lines, is the largest among the coastal fisheries in terms of weight (Table 5), the hake fishery, using pole and lines, bottom nets, and longlines, is the greatest in terms of economic value (Table 6). The other species are substantially less important than these two in both catch weight and value. Excluding the hake and mackerel fisheries, bottom net catch weights and values were the greatest, followed by longlines. The bottom net fishery is the most valuable overall despite having lower total fleet GRT and HP than the longline and pole and line fisheries (Tables 4 and 6). The trap fishery, catching only crustaceans, is the smallest among the coastal fisheries in number of vessels, catch weight, and value.

Table 4. Number of vessels and their technical characteristics employed in the coastal fleet, by gear type, 1991-1992.

Method	Vessels	Vessel average				Entire fleet		
		Length (m)	GRT	HP	Crew	GRT	HP	Crew
Longlines/hand lines	115	12.5	20.4	140	3.3	2,340	16,082	387
Bottom nets	71	10.3	10.9	91	2.9	772	6,457	203
Pole and lines	31	15.5	30.0	215	5.1	931	6,675	157
Traps	14	8.3	7.4	66	2.1	103	921	28
Total	231	-	-	-	-	4,146	30,135	775

Table 5. Landings (tonnes) by species and gear type in the Basque coastal fleet. Data from July 1991 – June 1992.

Common name	Scientific name	Bottom net	Longline	Pole and line	Hand line	Trap	Total
European hake	<i>Merluccius merluccius</i>	174	127	165	-	-	466
Sea bream	<i>Pagellus cantabricus</i>	-	2	-	-	-	2
Conger eel	<i>Conger conger</i>	1	56	-	-	-	57
White hake	<i>Urophycis tenuis</i>	-	77	-	-	-	77
European seabass	<i>Dicentrarchus labrax</i>	4	21	-	-	-	25
Striped red mullet	<i>Mullus surmuletus</i>	45	-	-	-	-	45
Angler	<i>Lophius piscatorius</i>	35	1	-	-	-	36
Red sea scorpion	<i>Scorpaena lutea</i>	13	1	-	-	-	14
Atlantic mackerel	<i>Scomber scombrus</i>	262	12	46	3,679	-	3,999
Sharpnose sevengill shark	<i>Heptranchias perlo</i>	-	107	-	-	-	107
Chub/Spanish mackerel	<i>Scomber japonicus</i>	1	-	-	-	-	1
Atlantic horse mackerel	<i>Trachurus trachurus</i>	97	12	107	2	-	218
Pouting	<i>Gadus luscus</i>	59	3	-	-	-	62
Crustaceans		3	-	-	-	74	77
Other		132	40	8	-	-	180
Total		826	459	326	3,681	74	5,366

Table 6. Value of the landings of the Basque coastal fleet, in millions of current (2001) pesetas^{a)} (1991-1992).

Common name	Scientific name	Bottom net	Longline	Pole and line	Hand line	Trap	Total
European hake	<i>Merluccius merluccius</i>	150	132	173	-	-	455
Sea bream	<i>Pagellus cantabricus</i>	0	4	0	-	-	4
Conger eel	<i>Conger conger</i>	0	18	0	-	-	18
White hake	<i>Urophycis tenuis</i>	0	34	0	0	0	34
European seabass	<i>Dicentrarchus labrax</i>	6	36	0	-	-	42
Striped red mullet	<i>Mullus surmuletus</i>	54	0	0	-	-	54
Angler	<i>Lophius piscatorius</i>	22	1	0	-	-	23
Red sea scorpion	<i>Scorpaena lutea</i>	27	1	0	-	-	28
Atlantic mackerel	<i>Scomber scombrus</i>	30	1	5	140	-	176
Sharpnose sevengill shark	<i>Heptranchias perlo</i>	0	20	0	-	-	20
Chub/Spanish mackerel	<i>Scomber japonicus</i>	0	0	0	-	-	0
Atlantic horse mackerel	<i>Trachurus trachurus</i>	21	3	16	0	0	40
Pouting	<i>Gadus luscus</i>	8	0	0	-	-	8
Crustaceans		4	0	0	-	30	34
Others		53	16	3	-	-	72
Total		375	266	197	140	30	1,008

^{a)} 100 pesetas = US\$ 0.55 (27-September, 2001).

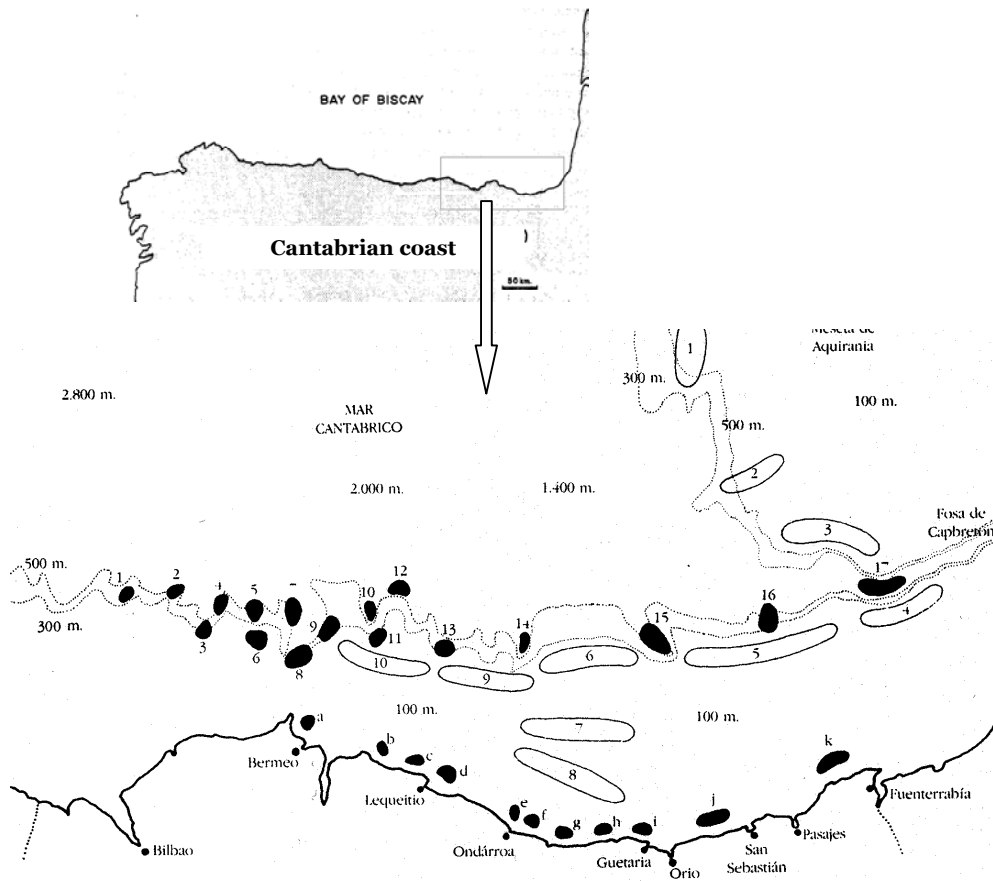


Figure 6. Fishing grounds along the coast of Basque Country (see insert for general location). Dark-colored grounds a-k: coastal grounds for hand lines, lines, drift nets and other fixed bottom nets for a great variety of fishes. Dark-colored grounds 1-17: hand lines and longlines on the border of the continental shelf for seabream, hake and related species. Light-colored grounds 1-10: small grounds for trawling.

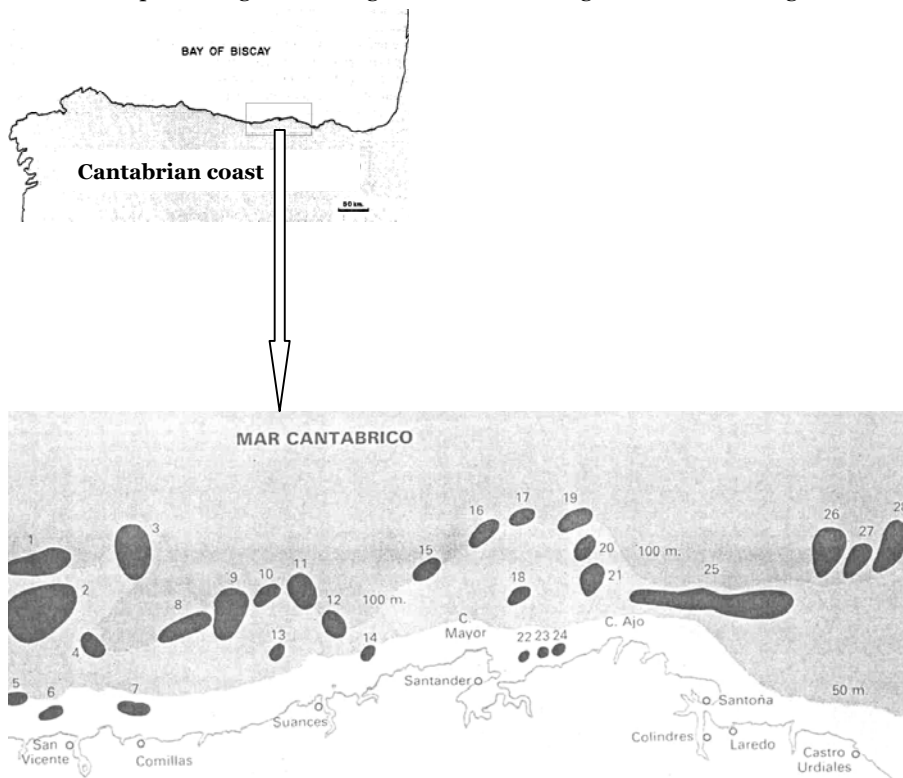


Figure 7. Fishing grounds along the Cantabrian coast (see insert for general location). Grounds 1-28: coastal grounds for hand lines, lines, drift nets and other fixed bottom nets for a great variety of fishes, as well as hand lines and longlines on the border of the continental shelf for seabream, hake and related species.

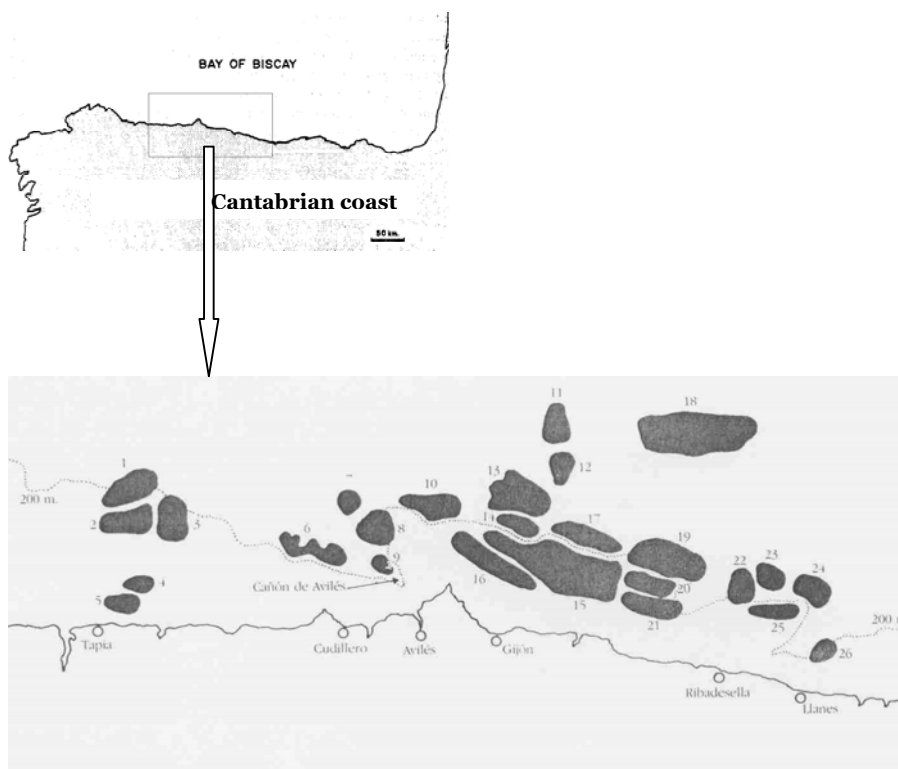


Figure 8. Fishing grounds on the Asturian coast (see insert for general location). Grounds 1-26: coastal grounds for lines, longlines and bottom nets.

Surface fleet (Pelagic fleet)

Fisheries for anchovy, tuna, albacore, mackerel, pilchard and horse mackerel are the most important in the center and east of area VIII, although albacores are also important in the western corner of the area in ports of the province of Lugo in Galicia. Albacore and anchovy landings constitute the main source of earnings for the fishers of this fleet. The processes and vessels used are remarkably different from the coastal fleet. Vessels of 100 GRT or larger are equipped to fish with purse seines and different line systems for tuna and albacore (Tables 7 and 8). In absence of these main target species, fishers rely more on other

species, especially mackerel, horse mackerel, and in some ports northern bluefin tuna, and species distribution of landings are determined by fishing seasons (Table 9).

Table 7. Number of vessels and their technical characteristics employed by the Basque pelagic fleet, 1991-1992.

	Vessels	GRT	HP	Crew
Entire fleet	189	19,949	93,299	2,673
Per boat	-	105.55	493.65	14.14

Table 8. Number of vessels and their technical characteristics employed by both the Basque coastal and pelagic fleets, by gear type, in 1999.

Gear type	Vessels	Per vessel		Entire fleet	
		HP	GRT	HP	GRT
Purse seines (anchovy, horse mackerel)	70	439.4	89.62	30,757	6,273.21
Live bait system (albacore, tuna)	55	595.3	125.51	32,742	6,902.92
'Cacea' (lines while sailing) (albacore)	8	227.3	31.82	1,818	254.59
Pole and lines (hake and demersals)	19	217.5	35.83	4,132	680.70
Longlines (demersals)	42	146.5	24.80	6,153	1,041.74
Traps	5	39.0	3.48	195	17.39
Other methods (mainly bottom nets)	138	126.2	18.01	17,415	2,485.35
Total	337	-	-	93,212	17,655.90

Table 9. Fishing schedule for each target species of the surface fleet in ICES area VIII, in the Basque Country.

Species	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Pilchard	-----	-----	-----	-----	-							
Anchovy		---	-----	-----	-----	-----						
Albacore							-----	-----	-----	-----		
Bluefin					--	-----	-----	-----	---			
Mackerel	-----	-----	-----									
Horse mack.			-----	-----	-----	-----	-----	-----				

Trawl fleet

Landings and vessels of the trawling fleet in area VIII have decreased substantially since the mid-1970s (Figure 9), for two reasons. The first is overfishing; while the second involves the institutional changes that adversely affected the Spanish deep sea fishing fleet. The new 'Law of the Sea' dramatically changed the ways the Spanish fleet fished in European grounds. After long and intensive discussions, the European Community accepted the Spanish presence in its waters but established a strict system of licences and quotas that was maintained after Spain entered the European Union (EU) in 1986. Figure 10 shows the most important trawling grounds visited by Spanish trawlers in ICES areas VIII and VII.

The Spanish trawling fleet in area VIII has historically targeted hake, one of the most valuable fishes on the Spanish market. Along with hake, other species such as megrim, angler, soles, whiting, and ling (*Molva molva*) were commonly caught, though in lower numbers. At times they are all categorized together as 'hake and related species'. Only in the last few decades, since hake landings and populations began to decline while prices rose, have some of these other species increased in importance. Unfortunately, it is only possible to get statistics of the Spanish trawling fleet from ICES or NAFO, not from SFY. Therefore, it is commonly admitted that most of the landings data sent from Spanish official bodies to international institutions are underestimated. Similarly, it is difficult to get discard or by-catch data.

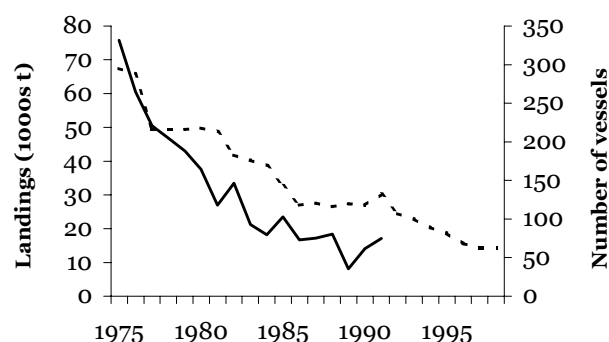


Figure 9. Landings (solid line) and number of vessels employed in trawl fisheries (dotted line) in the Basque Country (mainly in area VIII) during 1975 to 1998.

DISCARDS

Discard rates were estimated from available 1994 data for area VIII (Pérez *et al.*, 1996). These data, from random sampling of fishing vessels, are given as the percent of catches that are discarded by species, ICES area, and gear type. These estimates were assumed to be valid only for the 1990s, presuming the level of discards would not be the same for earlier decades. Total discard rates of all catches in area VIII for the four different gear types analyzed were: gillnets, 14.7%; longlines, 13.1%; purse seines, 13.5%; and trawls, 44.9%.



Figure 10. Trawling grounds in ICES areas VIII and VII used by Spanish vessels.

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